

*Abstract accepted for publication
in Circulation*

The impact of body mass index and body weight changes on prognosis in patients with chronic heart failure: results of the COMET study.

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The long-term impact of low body mass index (BMI) and weight loss in patients with chronic heart failure (CHF) treated with ACE inhibitors and beta blockers is not known. There is no data on the prognostic value of weight gain in CHF.

Methods: In COMET 3029 patients with CHF in NYHA II-IV and EF<40% were randomised to carvedilol (C) or metoprolol tartrate (M) and were followed for an average of 58 months. In 2596 patients with no baseline edema (85.7%), we analyzed the impact of BMI and weight change on survival and a combined endpoint of death or all-cause hospitalization.

Results: For each 1.0 unit increase in BMI, the risk of death decreased by 6.1% ($p<0.0001$), independently of treatment assignment. Event rates for 58 months of follow-up and hazard ratios (HR) in each BMI category are shown below:

BMI group	%death	HR	%death/hospitalization	HR
<22 (n=302)	48.9	2.29***	81.6	1.60 ***
22-<25 (n=672)	39.3	1.70***	75.6	1.24 **
25-<30 (n=1145)	32.1	1.28*	72.8	1.13 +
≥30 (n=474)	25.3	1.00	68.1	1.00

+ $p=0.056$, * $p<0.05$, ** $p<0.003$, *** $p<0.0001$

Excluding weight observations with edema, the respective weight change at 1 and 3 yrs follow-up were 1.6 ± 5.0 and 2.2 ± 6.2 kg on C and 1.6 ± 4.8 and 2.0 ± 6.2 kg on M ($p>0.15$ for all visits between 4 and 60 months). At 1 and 5 years, the cumulative incidence of ≥6% weight loss was 13 / 29% (C) and 11 / 26% (M, $p>0.2$). The respective incidence of ≥5% weight gain was 32 / 51% (C) and 33 / 52% (M, $p>0.2$). In time-dependent models considering the complete follow-up period, we found that both weight loss and weight gain carried prognostic value, independently of BMI and treatment assignment. Per percent weight loss, mortality was increased 8.7% (95%CI 7.1-10.3%, $P<0.0001$). Per percent weight gain, mortality was reduced 2.2% (0.6-3.7%, $p=0.0058$).

Conclusion: In CHF, lower BMI and weight loss are both associated with higher mortality and hospitalization rates. Weight gain is associated with lower mortality and lower hospitalization rates. Treatments promoting weight gain may be beneficial for patients with CHF.